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Abstract

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Composite plastic compositions based on the dispersion of selected cross-linked polymers in certain thermoplastic matrices are disclosed. The composite compositions are readily formed and processed by thermal extrusion processes versus conventional casting processes. Preferred composite plastics compositions based on cross-linked poly(alkyl (meth)acrylate) polymers and modified poly(alkyl (meth)acrylate) thermoplastics are especially useful in the preparation of synthetic architectural materials having a mineral-like appearance, such as that of granite.

C- Amend the Claims as follows:

A3 Sub 1
7 1. (amended). A composite plastics composition comprising a particulate crosslinked polymer dispersed within a thermoplastic matrix, wherein:

(a) the composite plastics composition comprises 10 to 45 weight percent of the crosslinked polymer, based on the weight of the composite plastics composition, and the crosslinked polymer has a particle size substantially from 0.2 to 1.2 millimeters;

(b) the crosslinked polymer comprises 0.1 to 15 weight percent inert filler and 0.1 to 20 weight percent crosslinker, based on the total weight of crosslinked polymer; and

(c) the crosslinked polymer is visually differentiable from the thermoplastic matrix,

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wherein the thermoplastic matrix comprises 50 to 100 weight percent poly(alkyl (meth)acrylate) and zero to 50 weight percent impact modifier, based on the weight of thermoplastic matrix and

wherein the impact modifier is a multi-stage sequentially-produced polymer comprising at least three stages in a sequence of a non-elastomeric first stage, an elastomeric second stage and a non-elastomeric third stage.

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3. (amended) A composite plastics composition according to claim 1 wherein the poly(alkyl (meth)acrylate) comprises a copolymer of 80 to 99 weight percent methyl methacrylate monomer units and 1 to 20 weight percent (C_1 - C_{10})alkyl acrylate monomer units, based on total weight of the poly(alkyl (meth)acrylate).

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5. (amended) A composite plastics composition according to claim 1 wherein the multi-stage polymer is an emulsion polymer comprising monomer units of methyl methacrylate in the first stage, monomer units selected from one or more of butadiene, styrene and (C_1 - C_8)alkyl acrylates in the second stage, and monomer units selected from one or more of (C_1 - C_4)alkyl methacrylates, styrene and acrylonitrile in the third stage.

6. (amended) A composite plastics composition according to Claim 1 wherein the crosslinked polymer comprises 90 to 99.5 weight percent monomer units selected from one or more of vinylaromatic monomer and (meth)acrylic monomer and 0.5 to 10 weight percent crosslinker, based on

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the weight of crosslinked polymer, wherein the crosslinker is selected from one or more of allyl methacrylate, ethylene glycol dimethacrylate and divinylbenzene.

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9. (amended) A composite plastics composition according to Claim 1 wherein the inert filler is selected from one or more of titanium dioxide, iron oxide, alumina, pigments, carbon black and silica.

10. (amended) A composite plastics composition according to Claim 1 wherein the particle size of the crosslinked polymer is substantially from 0.3 to 1.2 millimeters.

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12. (amended) A process for preparing a composite plastics composition comprising:

(a) preparing a crosslinked polymer comprising 0.1 to 15 weight percent inert filler and 0.1 to 20 weight percent crosslinker, based on the weight of crosslinked polymer;

(b) comminuting the crosslinked polymer to particles having a particle size substantially from 0.2 to 1.2 millimeters;

(c) dispersing 10 to 45 weight percent of the particles of crosslinked polymer within 55 to 90 weight percent of a thermoplastic matrix by a heat processing treatment; and

(d) recovering the composite plastics composition as a particulate material,

wherein the thermoplastic matrix comprises 50 to 100 weight percent poly(alkyl (meth)acrylate) and zero to 50 weight

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percent impact modifier, based on the weight of thermoplastic matrix and wherein the impact modifier is a multi-stage sequentially-produced polymer comprising at least three stages in a sequence of a non-elastomeric first stage, an elastomeric second stage and a non-elastomeric third stage.

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14. (amended) A process according to claim 12 wherein the heat processing treatment of step (c) is selected from one or more of extrusion blending, hot-melt kneading and hot-melt batch mixing.

15. (amended) A composite plastics composition prepared by the process claimed in Claim 12.

16. (amended) A process for preparing a simulated mineral article comprising forming, with heat treatment of a composite plastics composition as claimed in Claim 1 into a sheet, laminated sheet or molded material.

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18. (amended) An extruded sheet material resulting from extrusion of a composite plastics composition as claimed in Claim 1.

19. (amended) A thermoformed product of a composite plastics composition as claimed in Claim 1.

D- Cancel Claims 2, 4, and 8.

REMARKS

Prior to this Response and Amendment the claims pending in the application were Claims 1 to 19. After amendment, the claims remaining in the application are 1(amended), 3(amended), 5(amended), 6(amended), 7,